

```

> a := 31;
a := 31 (1)
> b := 21;
b := 21 (2)
> 1/b mod a;
3 (3)
> igcd(a,b);
1 (4)
> g := igcdex(a,b,'s','t');
g := 1 (5)

```

```

> s,t;
-2,3 (6)
> s*a+t*b=g;
1=1 (7)
> t;
3 (8)
> a-t;
28 (9)

```

```

In Q[x]
> a := x^3-3;
a := x^3 - 3 (10)

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```

> b := x^2+3*x+3;
b := x^2 + 3x + 3 (11)

```

```

> gcd(a,b);
1 (12)

```

```

> g := gcdex(a,b,x,'s','t');
g := 1 (13)

```

```

> s,t;
-1/3 - x/6, -1/6 x + 1/6 x^2 (14)

```

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> expand(s*a+t*b);
1 (15)

```

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In Z5[x]
> a mod 5;
x^3 + 2 (16)

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> b;
x^2 + 3x + 3 (17)

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> Gcd(a,b) mod 5;
1 (18)

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```

> g := Gcdex(a,b,x,'s','t') mod 5;
g := 1 (19)

```

```

> s,t;
                                      $4x+3, x^2+4x$  (20)
=
> Expand(s*a+t*b) mod 5;
                                     1 (21)
=
> a,b;
                                      $x^3-3, x^2+3x+3$  (22)
=
> q := quo(a,b,x,'r');
                                      $q := x-3$  (23)
=
> r;
                                      $6x+6$  (24)
=
> expand(a-b*q-r);
                                     0 (25)
=
> q := Quo(a,b,x,'r') mod 5;
                                      $q := x+2$  (26)
=
> r;
                                      $x+1$  (27)
=
> Expand(a-b*q-r) mod 5;
                                     0 (28)
=
> a;
                                      $x^3-3$  (29)
=
> factor(a);
                                      $x^3-3$  (30)
=
> Factor(a) mod 5; # factor a over Z5
                                      $(x+3)(x^2+2x+4)$  (31)
=
> factor(a) mod 5; # factor a over Q
                                      $x^3+2$  (32)
=
> b := factor(a);
                                      $b := x^3-3$  (33)
=
> b mod 5;
                                      $x^3+2$  (34)

```

```

igcd, irem, iquo, igcdex, ifactor, ilcm for Z
expand,gcd,rem,quo,gcdex,factor,lcm for Q[x] Q(y1,...,yn)[x] over Q characteristic 0
Expand,Gcd,Rem,Quo,Gcdex,Factor,Lcm for Zp[x] and Zp(y1,...,yn)[x] characteristic p

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